






**Cabinet Environmental Intelligent Temperature
Control Module
CMS011-S01
User Manual**

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Symbol Definition	
	WARNING: Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	RISK OF ELECTRICAL SHOCK: Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	ESD HAZARD: Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user.

Safety& Caution Symbols

The following table lists Safety& Caution symbols used on equipments.














No.	Symbol	Description
1		Direct current (DC)
2		Alternating current (AC)
3		Ground (Earth) terminal
4		Protective earth (ground) terminal
5		Reference ground (Earth) terminal
6		Frame or chasis
7		Equipotentiality
8		On (power)
9		Off (power)
10		Caution, risk of electric shock
11		Caution, hot surface
12		Caution, risk of danger
13		Electrostatic sensitive devices (ESD)

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Cabinet Environmental Intelligent Temperature Control Module CMS011-S01

Section 1 Terminology and Abbreviation

Term	Explanation
Continuous operation	A control mode for fan operation. In this mode, the fan is on and runs at full speed.
Threshold control	A control mode for fan operation. In this mode, when the intelligent temperature control module (hereinafter called CMS011) monitors the actual temperature exceeds the temperature threshold, the fan will turn on and run at full speed. When the temperature is 1 °C lower than the temperature threshold, the fan will turn off.
Feedback control	A control mode for fan operation, only fitted for speed adjustment fan. In this mode, when the CMS011 monitors the actual temperature exceeds the target temperature, the fan speed is adjusted automatically based on the overtemperature.
In-cabinet bus	A bus that realizes power supply and data transmission among cabinet environmental intelligent temperature control module and other environmental monitoring modules (such as power supply monitoring module, temperature and humidity monitoring module).

Section 2 Product Overview

CMS011 is an intelligent device of monitoring and controlling cabinet temperature, which is the key module of cabinet environmental intelligent management system.

The module monitors temperature through built-in temperature transducer chip or external temperature transducer. When the temperature reaches the set value, the module will turn on the fan and accelerate the ventilation in the cabinet, thus to cool the cabinet down.

It can be accessed by three types of fans: ordinary fans, speed measuring fans and speed adjustment fans. The fan operation mode can be controlled by master computer software (continuous operation, threshold control and feedback control), so it can be applied in many scenarios.

It can be cascaded to power supply monitoring module, temperature and humidity monitoring module, corrosion monitoring module and other cabinet environmental monitoring modules to get data from these monitors and adjust devices in the cabinet. It can also be cascaded to other intelligent temperature control modules and connected to control nets through serial device network server, then it will send monitored data and logs to the master computer software.

It is powered by 220VAC power, and can output 24VDC to supply power for other environment monitoring modules in the system.

Section 3 Technical Specifications

Table 3-1 Technical specifications

Parameter		Description
Model		CMS011-S01
Working power supply	Working voltage	220 VAC, 50 Hz
	Access method	Terminal blocks
In-cabinet bus	Port type	RJ45 port
	Port anti-mixing	Support
	Cable	Category 5e Ethernet cable
	Communication	Connection method
		Cascade
		Module number
		16 (includes itself)
	Power supply	Communication rate
		115200 bps
Temperature monitoring	Communication distance	20 m
	Power supply voltage	24 VDC \pm 10%
RS-485 communication	Maximum output current	375 mA
Supply power for environmental monitoring module	Temperature monitoring range	-20 to +70 °C
	Temperature monitoring accuracy	\pm 2 °C
	Overtemperature alarm	It can be set by the software
	Number and type of port	1 channel with 2 sets of terminal blocks, used for cascade
	Baud rate	115200 bps, 38400 bps can be configured
Supply power for fan	Power supply voltage	24 VDC \pm 10%
	Maximum output current	375 mA
	Maximum module number	16 (includes itself)
	Power supply mode	RJ45 port, Supply power by category 5e Ethernet cable
	Port anti-mixing	Support
Supply power for fan	Voltage input	220V AC \pm 10%, frequency (50 \pm 1) Hz
	Voltage output	Voltage: 220V AC \pm 10%; current: 1 A (max)
	Fan status alarm	The fan operates abnormally when it's on.

Parameter		Description
EMC level		Industrial III B
Anti-corrosion level		G3 anti-corrosion
IP rating		IP20
Dimensions (W × H × D)		78 mm × 105 mm × 53 mm (3.07" × 4.13" × 2.09")
Temperature	Operating temperature	-20 to +70 °C
	Storage temperature	-40 to +85 °C
Humidity	Operating humidity	10% to 90% (RH), non-condensing
	Storage humidity	5% to 95% (RH), non-condensing

Section 4 Hardware Structure

The hardware structure of CMS011 is shown in Figure 4-1.

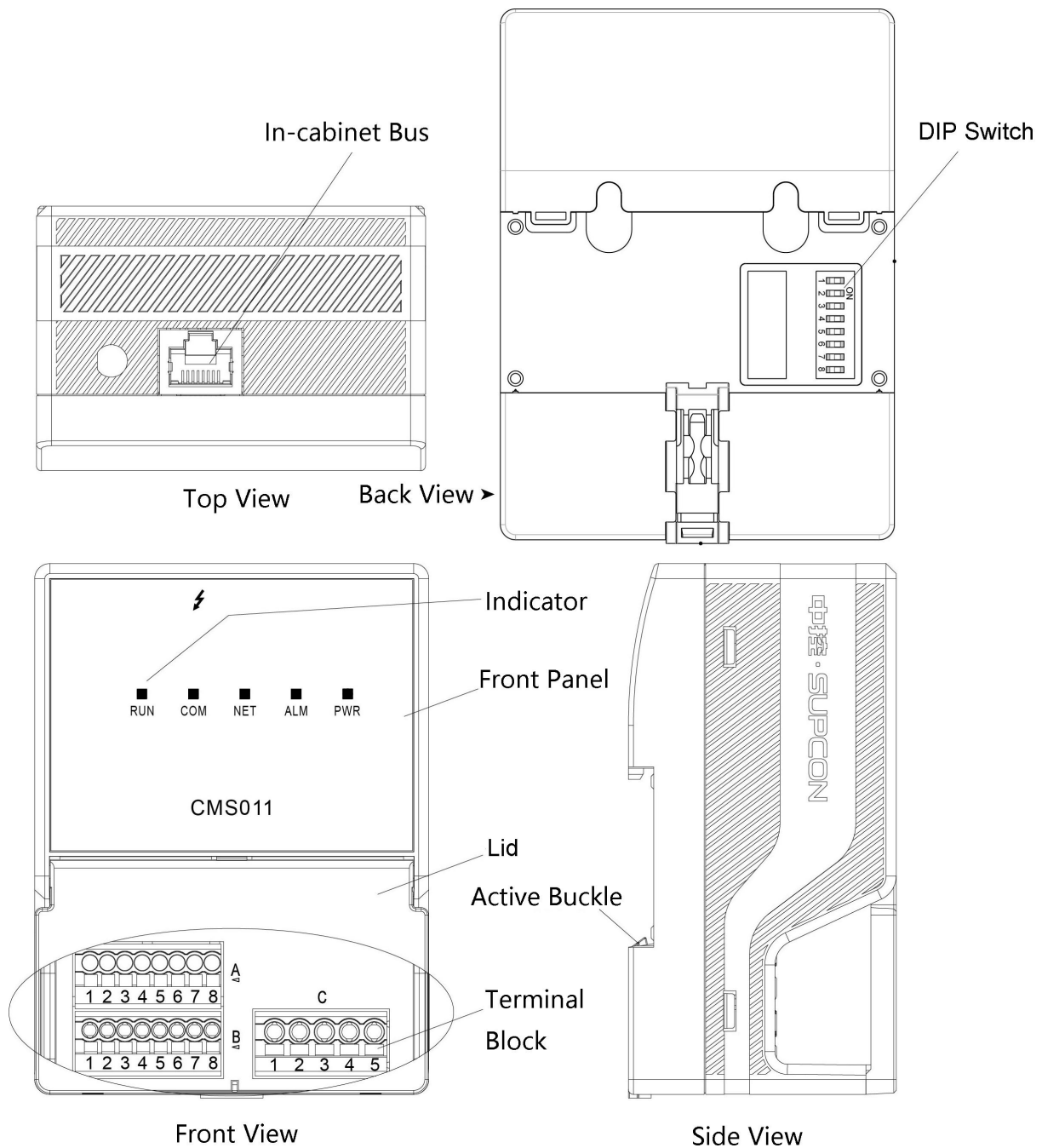


Figure 4-1 Structure diagram

Section 5 Setting Communication Address and Rate

RS-485 Communication

When CMS011 cascades with other modules to realize RS-485 communication, it can cascade with up to 31 modules in the cascade network. The communication address of all modules can't be the same, and it can be set by 8Pin DIP switch on the back of module.

8Pin DIP switch 1 to 5 can be used to set module communication address. The 8th set communication rate (ON means the rate is 115200 bps and OFF means the rate is 38400 bps). The relationship between the setting (ON or OFF) of the 1st to 5th DIP switch and address of communication module is shown in the following table.

Table 5-1 The relationship between 1st to 5th DIP switch and address of communication module

5	4	3	2	1	Address
OFF	OFF	OFF	OFF	ON	1
OFF	OFF	OFF	ON	OFF	2
OFF	OFF	OFF	ON	ON	3
...
ON	ON	ON	ON	ON	31

In-cabinet Bus Communication

When CMS011 cascades with other modules to communicate data through in-cabinet bus, the default communication address is 0 and no setup is required.

Section 6 Module Dimensions and Mounting



Risk of Electrical Shock:

Power supply of the module must be cut off before the mounting.

6.1 Dimensions

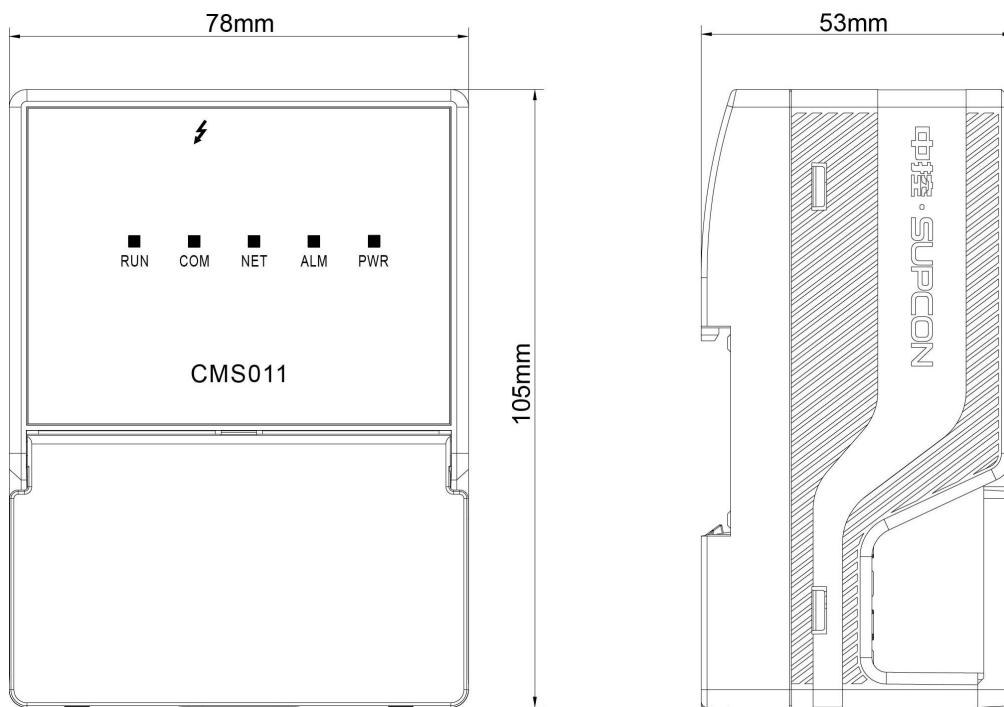


Figure 6-1 Dimensions

6.2 Mounting

The module applies standard DIN rail and it's generally mounted at the cabinet or the air outlet of the console.

- 1) Attach the side without buckle of the module to the rail, as ① shows in Figure 6-2.
- 2) Rotate the module and fix the side of active buckle into the rail as ② shows in Figure 6-2 to complete the installation.
- 3) Connect the wires and properly sort them.

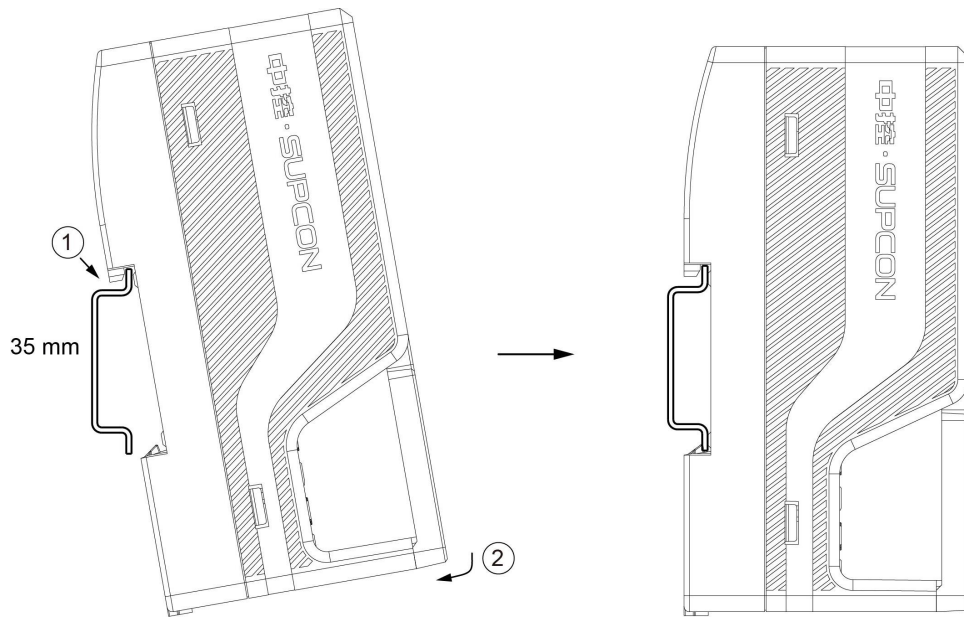


Figure 6-2 Mount the module

6.3 Disassembly

- 1) Cut off the power supply and disassemble the wires.
- 2) Pry open the active tab with the slotted screwdriver (medium or small size), as ① shows in Figure 6-3.
- 3) Rotate the module, as ② shows in Figure 6-3.
- 4) Remove the module from the guide rail and finish the disassembly.

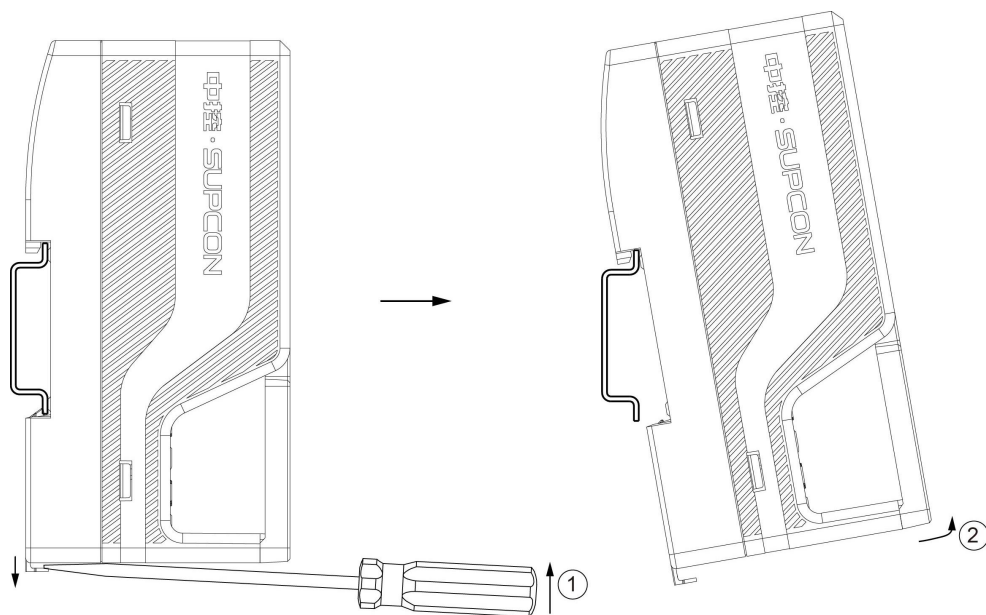


Figure 6-3 Disassemble the module

Section 7 Wiring Instruction

7.1 Terminals

The wiring method of CMS011's input and output ports is terminal wiring. The input terminal is on the top of the module and the output terminal is on the underside. The instructions of module wiring are shown in Table 7-1 and Table 7-2.

Table 7-1 Terminal wiring instruction of row A, B

Terminal mark of row A	Terminal instruction of row A		Terminal mark of row B	Terminal instruction of row B					
1	485+	The first channel of serial communication port	1	NTC pin	Connect to external temperature transducer				
2	485-		2	NTC pin					
3	485GND		3	Empty					
4	Empty		4	FG-5V	+5V	Speed measuring fan	—		
5	Empty		5	FG-GND	COM		Black	Speed adjustment fan	
6	485+	The second channel of serial communication port	6	FG-rotary speed	OUT		Yellow		
7	485-		7	FG-speed adjustment	—		White		
8	485GND		8	FG-PWR			Red		

Table 7-2 Terminal wiring instruction of row C

Terminal mark of row C	Terminal instruction of row C
1	L (220V AC power supply output-fire wire-supply power for fan)
2	N (220V AC power supply output-null wire-supply power for fan)
3	Empty
4	L (220V AC power supply IN-fire wire-working power of device)
5	N (220V AC power supply input-null wire-working power of device)

7.2 Cable Requirement

Communication and Power Cable Requirement

Category 5e straight-through type Ethernet cable

Terminal Cable Requirement

The cable that fits terminals of row A and row B is shown as following table. And the terminal of row A should use two-core shielded cable.

Table 7-3 Terminal cable requirement for row A and row B

Parameter	Description
Cross-sectional area	0.2 to 1.5 mm ²
Stripping length	10 mm
Slotted screwdriver	(0.4 × 2.5) mm

The cable that fits to the terminal of row C is shown in the table below.

Table 7-4 Terminal cable requirement for row C

Parameter	Description
Cross-sectional area	0.2 to 2.5 mm ²
Stripping length	10 mm
Slotted screwdriver	(0.4 × 2.5) mm

7.3 Example of Connecting Wires

- As ① shows in the figure below, a cascaded network can be built through the RJ45 port on CMS011 to realize data communication and power supply with intelligent temperature control module, power monitoring module and so on.
- The terminal blocks underneath the lid on the front of CMS011 are displayed as ②③④ shows below.
 - By connecting to terminals of 1, 2 and 6, 7, multiple CMS011 cascades can be realized. In the cascade network, a group of ports of the first CMS011 must be connected to RS-485 to Ethernet converter, and the cable shielding layer that is close to CMS011 must be connected to protective ground. Then in each cascade, cable shielding layer that is close to the next level of CMS011 must be connected to protective ground, as ② shows in the figure below. One RS-485 to Ethernet converter that can connect up to 31 CMS011 devices.
 - An external transducer can be connected to terminals 1, 2 in row B as ④ shows below. If the temperature data is from the temperature transducer in CMS011, you needn't to connect an external transducer. You can configure temperature measurement source on the master computer software.
 - In row B, a speed measuring fan can be connected to terminals 4, 5, 6, and a speed

adjustment fan can be connected to terminals 5, 6, 7, 8. Only one kind of the fans can be connected to one CMS011 at a time, as ④ shows in following figure.

- In the terminals of row C, input ports 4(L), 5(N) of 220VAC power supply are connected to the output ports 1(L), 2(N) of 220VAC power supply. 220VAC power supply output port is connected to that of normal fan, as ③ shown in the following figure.

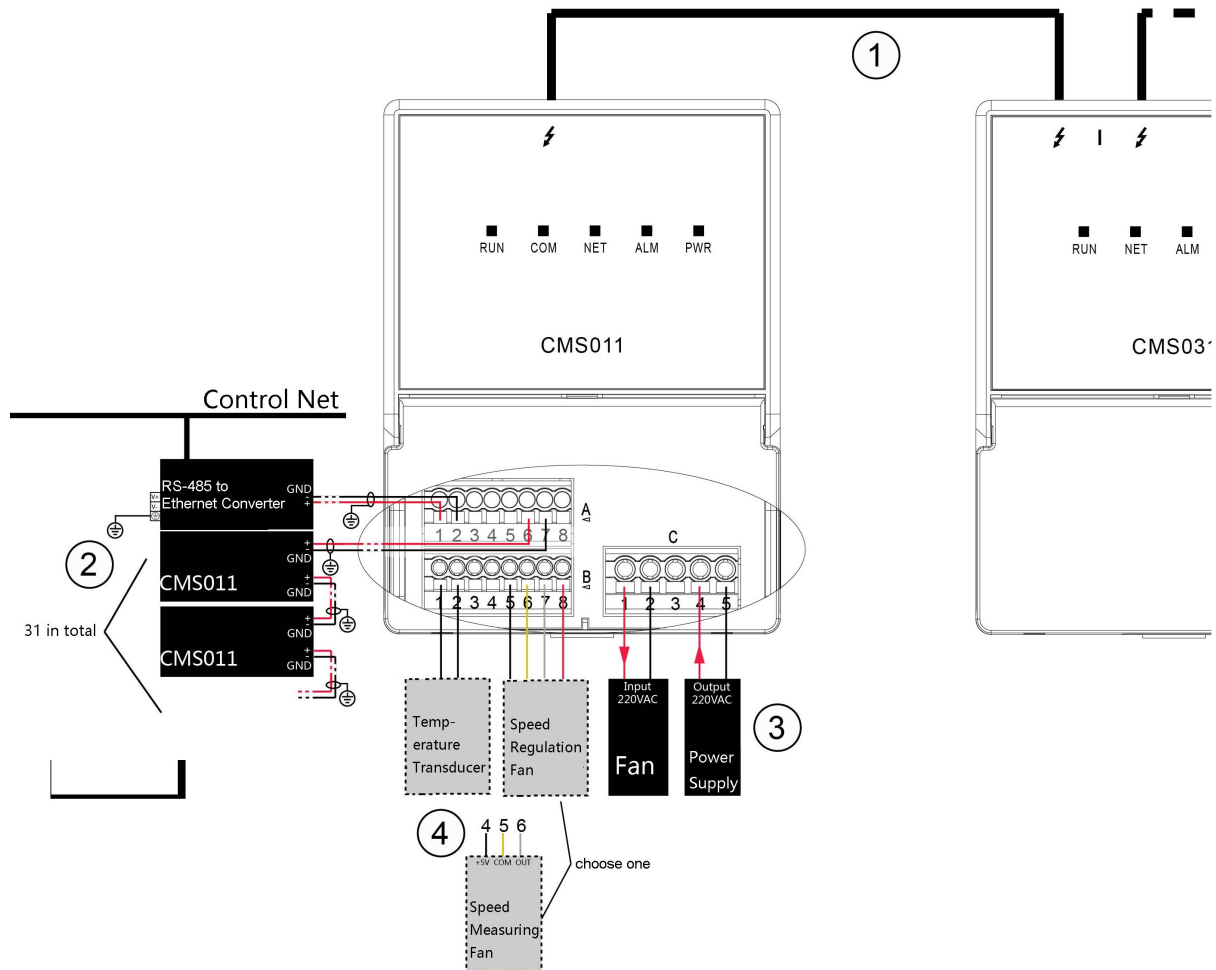


Figure 7-1 Example of connecting wires

Section 8 Project Application Instruction

8.1 Precautions

1. Together with DI module, CMS011 sends the alarm to system status diagnostic software according to the dry contact signal input method.
2. There is no fuse when CMS011 outputs 220V AC, so it's recommended to add a fuse with a capacity of about 1 A on the external to protect from short circuits when connecting fans to supply power.

8.2 Fault Analysis and Troubleshooting

There is a group of indicators on the module panel which indicates the module operating status. When the fault occurs, you can troubleshoot according to the table below.

Table 8-1 Indicator's Illustration

Indicator	Status	Indication and solution
RUN	Green flashing	No configuration
	Solid green	Normal
	Solid red	Module fault
COM	Green on for seconds	With data transmission
	Off	Without data transmission
NET	Green on for seconds	With data transmission
	Off	Without data transmission
ALM	Solid green	Normal
	Solid red	Module alarm
PWR	Solid green	Normal
	Off	The power supply is abnormal. Please check the power supply or change the module.

Section 9 Appendix A-Logs

Serial number	Type	Logs
1	Fault information	RS-485 communication fault, thermistor fault, fan fault
2		Network port mixing record
3	Alarm information	High temperature alarm
4	Data information	Configuration data area error
5		Calibration data area error
6	Cold and hot reset	Module cold reset
7		Module hot reset
8	Configuration	Successful configuration
9		The first time to receive time synchronization
10	Other events	Clear log record
11		Log circular recording

Section 10 Revision

Table 10- 1 Revision history

Version	Applicable product model	Remarks
V1.0(20230424)	CMS011-S01 V10.10.00	